already much restricted and blocked with swamp vegetation. There has been not only partial desiccation due to a lessening in the rainfall of West Central Africa, but also a raising of the lake level by the excessive growth of marsh vegetation—papyrus, reeds, rushes, grasses, and the ambatch tree. The water of Lake Chad would also seem to be increasing in salinity, which, however, does not appear to interfere with the growth of vegetation. On the contrary, when every now and then (according to the stories of the natives) the lake is partially recreated by floods from the Shari and the Komadugu and the water becomes fresh, the vegetation tends to disappear, partly by its being drowned, and partly because the water has lost some element suited to its growth.

Some further geographical information is given as to the Bahr-al-Ghazal Channel, or Soro, as it should preferably be called (in order not to confuse it with the name of the western basin of the Nile). This would seem to have been an ancient outlet of the flooded Chad, which carried these waters along a definite channel towards the north-east into the Bodele depression. Another possible *déversoir* of Lake Chad exists still in Lake Fitri, far away to the south-east, which this mission showed still to possess an area of open water of nearly 150 square miles.

H. H. JOHNSTON.

NOTES.

WE have received a programme of the International Congress on Radiology and Electricity to be held at Brussels on September 13–15. Among the important matters to be brought forward is the question of radium standards and nomenclature. The congress will be divided into three sections. In the first section, general questions of terminology and methods of measurement in radio-activity and subjects connected with ionisation will be discussed. The second section will be devoted to subjects relating to the fundamental theories of electricity, the study of radiations (including spectroscopy, the chemical effects of radiations, and allied subjects), radio-activity, atomic theory, and cosmical phenomena, such as atmospheric electricity and the radio-activity of the atmosphere. The third section is biological, and will be devoted to the consideration of the effects of radiations on living organisms. This section will deal with purely biological subjects, as well as the use and application of various radiations for medical purposes. A long list of papers already promised is given in the programme, as well as a list of members up to date. A special exhibit of apparatus relating to the work of members is to be held in connection with the congress, and members are invited to forward exhibits to the Physical Laboratory of the University of Brussels. A number of excursions have already been arranged to take place after the congress, and special facilities will be granted to members on the Belgian and French railways. Intending members should communicate with Dr. J. Daniel at Ostende, rue Wellington 28.

THE preliminary programme of the twenty-fifth congress of the Royal Sanitary Institute, to be held in Brighton on September 5–10 under the presidency of Sir John A. Cockburn, K.C.M.G., has now been issued. Dr. A. Newsholme (Principal Medical Officer, Local Government Board) will deliver the lecture to the congress on "The National Importance of Child Mortality." Dr. Alex. Hill will deliver the popular lecture on "The Bricks with which the Body is Built." In connection with the congress, a health exhibition of apparatus and appliances relating to health and domestic use will be held as practical illustration of the application and carrying out of the principles and methods discussed at the meetings. The congress will include general addresses and lectures, and there will be two section meetings for two days each, dealing with:—Section i., sanitary science and preventive medicine, *president*, Prof. E. W. Hope; Section ii., engineering and architecture, *president*, Mr. H. Rofe. Eight special conferences will be held, dealing respectively with municipal representatives; port sanitary authorities; medical officers of health; engineers and surveyors to county and other sanitary authorities; veterinary inspectors; sanitary inspectors; women on hygiene; and hygiene of childhood.

THE death is announced, at seventy-five years of age, of Prof. F. von Neumann, who from 1876 until 1909 held the chair of political economy at the University of Tübingen.

WE regret to see the announcement of the death of Dr. Louis Olivier, at fifty-six years of age. Dr. Olivier was the founder and editor of our esteemed contemporary the *Revue générale des Sciences*, which ever since it first appeared, twenty years ago, has taken a leading place among the scientific periodicals of the world.

THE International Horticultural Exhibition of 1912 will be held in the grounds attached to the Royal Hospital, Chelsea. These beautiful grounds were laid out by Sir Joseph Paxton, and they are well adapted for the purposes of a horticultural exhibition. The area leased to the exhibition authorities is approximately twenty acres, and nearly sixteen will be directly available for the accommodation of the exhibits. In the remaining portion, which includes some shrubberies, there are many fine specimen trees.

THE following news of north polar exploration has been sent to London by the manager of the Nordenfjeldske Steamship Company of Trondhjem:—*Kong Harold* has returned from polar ice. Reached 80° 10′, within 10° Pole. Met *Fram* expedition at Spitsbergen. *Fram* has discovered volcano and hot springs Wood Bay; beach covered with lava. Zeppelin has taken possession of tract of land at King's Bay, and has named it Zeppelinshafen.

IT is reported by the Polar Sea yacht *Laura*, which arrived at Tromsö on August 17 from East Greenland, that the expedition ship *Alabama*, belonging to the Danish explorer Captain Mikkelsen, was crushed by the ice at the end of March last. The crew were saved, and wintered on Shannon Island. The Copenhagen correspondent of the *Morning Post* states that Captain Mikkelsen with Mr. Iversen, who started from Shannon Island on March 3, are trying to reach Cape York, on the western coast of Greenland, travelling by way of Peary Channel and the inland ice. If insurmountable difficulties are encountered, they can return to Shannon Island, where a house, in which there are provisions sufficient for two years, has been built. On August 7 Captain Mikkelsen and his companion had not yet returned, and it is supposed that they continued their way through the Peary Channel to Cape York, or that they are returning along the east coast, having spent the summer there.

THE Anthropological Society of Paris, in the last issue of its *Bulletins et Mémoires*, gives a report of the meeting, attended by leading anthropologists from all parts of Europe, to commemorate the fiftieth anniversary of its foundation. An interesting feature in the report is a series of papers contributed by the foreign delegates describing the progress of research in the various parts of Europe. As representative of the Royal Anthropological

Institute, Prof. W. Ridgeway sketched the results attained in this country during the last fifty years. Describing the refusal of the Prime Minister of a grant in aid of the proposed Bureau of Anthropology, who at the same time admitted that a knowledge of the science was indispensable for our Indian and Colonial administrators, he added:—"If, then, in the United Kingdom we have not done all that we ought to extend the study of man, I beg you to remember that the Anthropological Institute has to depend upon the subscriptions of its members. Your distinguished society has long been recognised as of public utility by the State."

In *Folk-lore* for June Mr. Andrew Lang discusses the strange myth of Theseus and the Minotaur. He argues that the fact of human sacrifice in Minoan times is not established, and that the suggestion that Minos, like the priest kings described by Prof. J. G. Frazer, had to fight for his life at stated periods, rests upon a passage in Homer which cannot bear that meaning. He concludes that the historic fact in the Attic myth is the sending of Attic captives into the Cretan bull-ring, where boy and girl acrobats played perilous tricks with bulls, as often depicted in Cretan art. The rest of the myth is a common *märchen* localised.

In a recent number of the Journal of the Royal Society of Arts, a paper by Mr. H. Gibson is reprinted, embodying the investigations made by Mr. H. P. Slade of the dew-ponds on the Thorpe Downs, Berkshire. The result is to show that dew contributed nothing to the water supply, which appears to be entirely the consequence of rainfall. Dew, in fact, is only scantily deposited on such high grounds owing to draughts of air, which cause rapid re-evaporation. As the temperature of the water was found to be at night much lower than that of the surrounding air, the author believes that the possibility of dew condensation is disproved. He concludes that a catchment area consisting of galvanised corrugated iron stretched upon a wooden frame, with a roofed reservoir to collect and store the rainfall, would be more economical and sanitary, as a souce of water supply, than the most ingenious dew-pond ever constructed.

Information has been received by the *Times* that the new direct wire connecting Montreal with the Bamfield Creek cable station has been completed by the Canadian Pacific Railway, and was handed over to the Pacific Cable Board on Monday. The longest cable in the world (3458 nautical miles) is thus connected with a land line 3000 miles in length, and communication between Fanning Island (long. 159 W., lat. 3 N.) and Montreal (long. 75 W., lat. 45 N.) will be effected with only one retransmission. The Pacific Cable Board expects, as a result of this new arrangement, to be able to reduce the average time in transmission between Australasia and London by fifteen minutes.

A fifth report on research work carried out for the Metropolitan Water Board by Dr. Houston, director of water examination, has been issued. One important section contains the results of the examination of *raw* Thames and Lea water for the presence of the typhoid and Gärtner bacilli. The total amount of water dealt with was 12 litres, averaging 62,688 microbes per cubic centimetre. From this vast number of bacteria, one was isolated having all the characters of a typhoid bacillus; another corresponded to the Gärtner bacillus. If present, therefore, these microbes must be extremely scanty in the raw waters, for control experiments carried out with the raw waters artificially inoculated with these organisms showed that the methods employed sufficed to reveal a very small infection. Another search was for Morgan's bacillus No. 1, supposed to be a cause of summer diarrhœa of infants, but it was not found in the raw waters.

In the *Irish Naturalist* for August, Dr. A. R. Jackson records from Ireland a spider, *Erigone capra*, new to the fauna of the British Isles.

In the paragraph on the local forms of musk-ox in our last week's issue (p. 211), the statement that the range of the species extends to the west of the Mackenzie applies only to a past epoch.

To the August number of the *Naturalist* Mr. Sheppard contributes an illustrated article on Neolithic implements from Bridlington, where there appear to have been four sites for their manufacture, one of which occurs near Danes' Dyke, the ancient earthwork stretching across Flamboro' Head. All the implements are made from black flint, quite different from the local grey flint. Some of the specimens recently obtained, more especially a so-called sickle, are stated to be of unusual types.

To the Proceedings of the Philadelphia Academy for April Mr. J. P. Moore contributes the second part of an article on polychætous annelids dredged off the Californian coast by the *Albatross* in 1904. In the Polynoidæ twelve species are described as new, while four previously known from Japan are for the first time recorded from the American side of the Pacific. The other groups discussed are the Aphroditidæ and Segaleonidæ, of which new forms, including a new genus, are also described.

We have received from the author, Mr. P. H. Grimshaw, a copy of a paper from the July number of the *Annals of Scottish Natural History* on the species of insects frequenting Scotch grouse-moors. The list was compiled in connection with an investigation of the food of young grouse, undertaken at the instance of the Grouse Disease Committee, and it was considered that its publication might be of interest from a faunistic point of view. Species known to be eaten by grouse-chicken are denoted by asterisks.

In concluding an article on chromosomes and heredity, published in the August number of the *American Naturalist*, Prof. T. H. Morgan states, in a guarded manner, that some progress has been made in the interpretation of the mechanism by which sex is determined in the organism. He considers it certain "that we have discovered in the microscopic study of the germ cells a mechanism that is connected in some way with sex determination; and I have tried to show, also, that this mechanism accords precisely with that the experimental results seem to call for. The old view that sex is determined by external conditions is entirely disproven, and we have discovered an internal mechanism by means of which the equality of the sexes where equality exists is attained. We see how the results are automatically reached even if we cannot entirely understand the details of the process."

In reference to the recent article on "Wild Plants on Waste Land in London" (August 11, p. 184), a correspondent suggests that various seeds may have been brought to the ground in the nose-bags and hay trusses of horses employed during the demolition of the buildings or passing along the neighbouring streets. Many of the plants on the waste ground near the Strand are common weeds of arable land.

Much interest attaches to two palæobotanical papers by Dr. E. C. Jeffrey that have been published in the Proceedings of the Boston Society of Natural History (vol. xxxix., Nos. 9 and 10). In the first the author describes a petrified stem taken from the remains of a Triassic forest in Arizona, that presents several novel features. The wood structure resembles that of living representatives of the Araucarineæ, but the plant produced short shoots that persisted and elongated with the growth of the stem. The leaf traces, on the contrary, did not, as in present-day genera, persist in the secondary wood. The author regards the persistent short shoots as primitive, and therefore indicating the antiquity of the two coniferous groups of Abietineæ and Araucarineæ in which these characters occur. The second paper deals with fossil remains of a conifer, collected in Massachusetts in the Lower Cretaceous days, in the shape of two short shoots similar to, but distinct from, the brachyblasts of Pinus, and referred to the genus Prepinus previously proposed by the author.

A popular account of the date gardens of the Jerid at the northern fringe of the Sahara Desert is contributed by Dr. T. H. Kearney to the American *National Geographic Magazine* (July). The author's journey was undertaken with the object of obtaining palms for the date orchards established by the United States National Department of Agriculture in Arizona and California. The two largest oases in the Jerid district comprise about 6000 acres each. The ownership is much divided, as individual holdings range from a few square rods to several acres. More than a hundred distinct varieties are grown, differing in shape, colour, and flavour. The variety exported to Europe strikes the mean between the hard and very soft kinds, and is characterised by its translucent flesh and keeping quality. The method of propagation is by offshoots that arise from the base of the palm; these, when dipped in clay and bound with layers of leaf-stalk fibre, will travel safely any distance.

The Board of Agriculture and Fisheries reminds growers of potatoes that it is their duty under the Destructive Insects and Pests Order of 1910 to report to the Board all outbreaks of wart disease, otherwise known as black scab of potatoes, cauliflower disease, ' fungus," &c., in counties in which no officer has as yet been appointed by the local authority to receive reports. The penalty for neglecting to report disease is 10*l*. The presence of disease should be again reported this year, notwithstanding the fact that it may have existed and been reported last year. A leaflet describing the disease may be obtained on application to the Secretary, Board of Agriculture and Fisheries, 4 Whitehall Place. Letters so addressed need not be stamped.

The West Indian Bulletin (No. 3, vol. x.) contains an article by Mr. Ballou on legislation in the West Indies for the control of pests and diseases of imported plants. Such control has been exercised since 1884, and was considerably developed in 1898, when the Imperial Department of Agriculture was organised. The text of the various laws and proclamations is given, and certain modifications are suggested. It appears that legislation has been distinctly beneficial. Messrs. Bancroft and South briefly describe the fungi which have from time to time proved injurious to cultivated crops in the West Indies. The account is brought up to date, only a few minor unidentified forms being omitted. A note is added containing a summary of the diseases, probably caused by bacteria, which have not yet been fully investigated.

From the Agricultural and Forestry Department of the Nyasaland Protectorate we have received a Bulletin, by Mr. McCall, on bacterial blight in cotton caused by *Bact. malvacearum*, by far the worst enemy of Egyptian cotton cultivators in Nyasaland, having reduced the output of several estates by at least 60 per cent. in the past season. The disease first appears on the leaves, causing them to shed; then the bacteria get into the branches, and soon the flowers and bolls die. No method of control is yet known. Mr. Purves deals with tree-planting in the highlands of the country. In general, the natural timber consists of small slow-growing hard-woods and shrubs. There is an increasing demand for building timber and firewood, and it seems likely that plantations may be profitable. A number of suitable trees are recommended.

We have received from the Agricultural Institute at Pusa copies of several of their recent publications. The *Agricultural Journal of India*, which is intended as much for the intelligent lay reader as for the professed agriculturist, contains an article on the outbreak of blister-blight (*Exobasidium vexans*, Massee) on tea in the Darjeeling district in 1908 and 1909, which caused a considerable amount of damage. In the first instance the leaves are attacked, then the disease spreads to the leaf stalks and the young green stems, where the damage is more serious, although less conspicuous. The disease is not new, and has been known for more than forty years in the Brahmaputra valley in Upper Assam, but not elsewhere. The districts are widely separated, yet the disease has not appeared in intervening places. A memoir is issued by Mr. Annett on the cause of the colour of black cotton soil. He finds several per cent. of titaniferous magnetite, and also a certain proportion of humus, both contributing to the colour. Mr. Howard issues a report on his fruit experiments. Of the numerous interesting results one may be noted: the effect of grass growing round the tree was apparently fully as injurious as in the Woburn experiments. Tillage of orchards, however, is not an unmixed advantage, as it exposes the soil to considerable washing in the rainy season. A system of embanking combined with monsoon leguminous cover crops seems to be the best means of preventing this loss. Dr. Butler describes the wilt-disease of pigeon pea, which he finds is brought about by *Fusarium udum*, n.sp.

The U.S. Weather Bureau has issued its useful meteorological charts of the North Atlantic and North Pacific Oceans for September, and of the South Atlantic and South Pacific for the season September–November, 1910. The North Atlantic chart contains an account of the violent West India hurricane of September 16–21 last, with synoptic charts showing the existing weather conditions at Greenwich noon over the North Atlantic and Gulf of Mexico during that period. On September 16 the storm was south-west of Jamaica, moving north-westward, and warnings of its approach were issued to various ports. It continued its north-westerly direction, reaching the Gulf ports on September 20, where exceptional severity was experienced, thence curving northwards and moving up the Mississippi Valley. About half the coal fleet anchored along the banks of that river were sunk, but the remainder were saved as a direct result of the action taken on the advice of the Weather Bureau. Arrangements have been made by the Bureau to obtain during the present hurricane season (July to November) wireless storm telegrams from vessels in the Gulf of Mexico and all West Indian waters.

IN connection with the production of undamped electrical oscillations of high frequency by the arc and condenser method, Messrs. M. Kimura and K. Yamamoto, of the Kyoto University, have carried out a series of determinations of the effects of atmospheres of various vapours on the volt-ampere "characteristic curves" of the carbon-copper arc. The carbon electrode was solid, and was used as the kathode. The copper anode was water-cooled. The curves obtained are all of the usual form, which suggests a rectangular hyperbola, and show that the vapours tried stand in the following order of relative efficiency:—hydrogen, hydrogen mixed with benzene, methyl alcohol, methyl and ethyl alcohols mixed, ethyl alcohol, air, the volts absorbed for a given current being highest for hydrogen. The complete paper is contained in part iv. of the second volume of the Memoirs of the College of Science and Engineering of Kyoto University, just to hand.

THE following figures for the solubility of ether in water are given by Mr. Y. Osaka in the Memoirs of the College of Science at Kyoto, and will be of interest to people who are constantly making use of this solvent:—

Temperature	0°	5°	10°	15°	20°	25°	30°	
Solubility (Osaka)	13·13	11·18	9·55	8·22	7·08	6·13	5·39	gr. per 100 gr. wat r.
Solubility (Seidell)	13·12	11·4	9·5	8·2	6·95	6·05	5·4	gr. per 100 gr. water.

PROF. BONE and Dr. H. F. Coward have replied, in the Journal of the Chemical Society, to the criticisms by Berthelot and others of their work on the production of methane by the direct union of hydrogen with carbon. In their most recent experiments they have obtained yields of 95·8, 95·6, and 91 per cent. of that theoretically obtainable from the weight of carbon used. The carbon used was particularly pure, containing not more than 0·06 per cent. of hydrogen, or 0·06 per cent. of ash. The gas produced (at 1150°) contained only a trace of carbon monoxide, never exceeding 0·03 per cent., and the amount of nitrogen was also very small.

IT is seldom now that one firm is entrusted with the order for as many as ten vessels for any navy, and the successful completion of such an order by Messrs. Yarrow and Co. for the Brazilian Government forms the subject of an article in *Engineering* for August 19. The ten torpedo-boat destroyers are all of one design, an important advantage both from the tactical point of view and also from the standpoint of management by Brazilian officers and crews. They partake generally of the British "river" class, in which were embodied greater strength and other qualities to enable the vessels to maintain their speed in a heavy sea. The guaranteed speed of 27 knots has been easily exceeded by every ship. The length between perpendiculars is 240 feet, and the displacement is 650 tons. The ratio of length to beam is 10·2 to 1. Each vessel has two sets of four-cylinder triple-expansion engines, balanced on the Yarrow-Schlick-Tweedy system, and supplied with steam from two double-ended Yarrow boilers. The greatest power developed on an official trial was 8877 indicated horse-power, in the case of the *Parana*. The coal-consumption trials showed that at 14 knots speed the radius of action was 3690 nautical miles.

Engineering for August 19 directs attention to the important and continuous increase in Germany's imports of British coal—from 1899 to 1909 the increase is more than 115 per cent. The figures are 4,873,555 tons in 1899 to 10,498,118 tons in 1909. In no place, perhaps, has British coal to a more marked extent encroached upon German coal than in Berlin. In 1890 British coal consumption in Berlin amounted to 105,894 tons, or 7·53 per cent.; last year the respective figures were 946,102 tons, and 39·88 per cent. The total consumption in Berlin in the two years was respectively 1,406,961 tons and 2,372,310 tons. Coinciding with this increase in British coal consumption is a notable decrease in the consumption of coal from Silesia, and it is from this quarter also that complaints are loudest. Fears are openly expressed that British coal is in a fair way of, lastingly and fully, securing the Berlin market unless proper precautions are taken soon and with the greatest possible energy. The increase in import of British coal to Berlin is to a great extent owing to the growing consumption of British gas-coal at the Berlin gas-works.

MANY ingenious pieces of apparatus for illustrating the principles and laws of heat are described and illustrated in a new catalogue (List 56) just issued by Messrs. A. Gallenkamp and Co., Ltd. The aim of the makers has been to produce at a moderate price instruments which can be used continuously by students without getting out of order, and will yield accurate results. A noteworthy feature is the inclusion of a number of new devices which have been described in text-books or periodicals, or before scientific societies. Teachers of physics will find the catalogue of service in the selection of experiments for the lecture-room and laboratory.

OUR ASTRONOMICAL COLUMN.

THE PERSEID METEORIC SHOWER.—Observations of this phenomenon have been received by Mr. Denning from twelve stations, and he informs us that the results are fairly satisfactory. Clouds, it is true, greatly interfered with watching on the important nights of August 11 and 12, but August 10 was clear.

The character of the display seems to have been of an average character. Meteors were not strikingly abundant, but there were enough to make the event exciting and to attract the interest of the general public. In Norfolk one observer was very successful, and relates that he counted twenty-one meteors in eight minutes between 1h. 16m. and 1h. 24m. on the morning of August 12, and estimated that they were falling at the rate of about 250 per hour! Other observers give the number as much less, but testify as to the brilliancy of some of the individual meteors.

Mr. C. L. Brook, of Meltham, saw splendid Perseids on August 8, 11h. 26½m., and on August 10, 12h. 5½m., with paths from 319° + 68° to 279° + 50° and 7½° + 41½° to 350° + 25° respectively. Mr. W. H. Steavenson, at Cheltenham, recorded the latter as moving from 90° + 58° to 120° + 48°, and saw another magnificent meteor at 13h. 11m., twice as bright as Venus, shooting from 120° + 48° to 135° + 40°. Others, comparable with Jupiter, followed at 13h. 18m. and 13h. 30m. The fireball of 12h. 5½m. fell from a height of 81 to 51 miles over the eastern region of Yorkshire. Its length of path was 45 miles, and velocity about 31 miles per second. It was a true Perseid, with radiant at about 45 + 56, but the exact place is not defined, as at Meetham Mr. Brook saw the meteor moving westwards, while at Cheltenham Mr. Steavenson observed it travelling to east.

Miss Warner, at Bristol, saw a number of meteors on August 10, the finest being a Perseid equal to Venus at 10h. 25m. It was, however, very low in the east, passing under Andromeda and Pegasus. Mr. D. E. Packer, of Birmingham, saw 200 meteors in watches of twenty-one hours between July 31 and August 14. There were thirty of the apparent brightness of Jupiter and twenty equal to Saturn.

Mr. W. Johnson, of Lastingham, witnessed a fine meteoric display on August 12. During the evening there were many brilliant meteors, including two of quite exceptional lustre. The display seemed at its best between 11 and 12 p.m.; clouds prevented observations after midnight.

METCALF'S COMET, 1910*b*.—Numerous observations of the comet discovered by the Rev. J. H. Metcalf on August 9 are recorded in No. 4434 of the *Astronomische Nachrichten*.